

Appl. No. 10/589,418  
Amdt. Dated February 20, 2008  
Reply to Office Action of September 20, 2007

**• • • R E M A R K S / A R G U M E N T S • • •**

The Official Action of September 20, 2007 has been thoroughly studied. Accordingly, the following remarks are believed to be sufficient to place the application into condition for allowance.

By the present amendment independent claim 1 has been changed to recite the use of paraformaldehyde and trioxane rather than "a formaldehyde generating compound" due to the Examiner's position that the term "a formaldehyde generating compound" was indefinite.

Support of the change to claim 1 can be found in paragraph [0008] of applicants' specification.

Entry of the changes to the claims is respectfully requested.

Claims 1-4 are pending in this application.

On page 3 of the Office Action the Examiner has reminded applicants of their duty to submit references cited in the specification in a separate paper (IDS).

It is noted that an IDS was filed with the original application on August 15, 2006 in which the two prior art references in the specification were cited and with which copies of these two references (together with prior art cited in the International Search Report).

The Examiner is requested to acknowledge receipt of applicants' IDS together with the prior art references submitted therewith.

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Note, reference JP-B-2-37904 cited in the specification on page 1 corresponds to JP 61-130254 as these documents have the same base application no.)

The Examiner has rejected "Claims" (no numerical listing) under 35 U.S.C. §112, second paragraph. Under this rejection the Examiner has taken the position that the term "a formaldehyde generating compound" was indefinite.

In response to this rejection, claim 1 has been amended to recite the use of paraformaldehyde and trioxane rather than "a formaldehyde generating compound"

This change to claim 1 is believed to address and overcome the outstanding rejection under 35 U.S.C. §112, second paragraph.

Claims 1-4 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Weinmayr (JOC, 28, 492-4, 1963).

For the reasons set forth below it is submitted that all of the pending claims are allowable over the prior art of record and therefore, the outstanding prior art rejection of the claims should properly be withdrawn.

Favorable reconsideration by the Examiner is earnestly solicited.

The Examiner has relied upon Weinmayr as teaching:

...a process for producing 2,2,3,3-tetrafluorooxethane by reacting [sic] fluoroolefins with formaldehyde in hydrogen fluoride. Trifluoroethylene condenses with formaldehyde in liquid hydrogen fluoride to form 2,2,3,3-pentafluoro-1-propanol and fluoromethyl 1-2,2,3,3,-pentafluoropropyl ether. See the entire document especially abstract, 1-32, 1<sup>st</sup> column on page 493.

On page 6 of the Office Action the Examiner has taken the position that:

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It would have been obvious....to prepare 2,2,3,3-tetrafluorooxethane, by formaldehyde or its derivative and anhydrous hydrogen fluoride because prior art teaches this method.

The Examiner has relied upon the abstract of Weinmayr as teaching "a process for producing 2,2,3,3-tetrafluorooxethane;" however, the Examiner has overlooked that Weinmayr teaches that the 2,2,3,3-tetrafluorooxethane is formed as a "minor by-product." In this regard, Weinmayr is concerned with forming 2,2,3,3,3-pentafluoro-1-propanol and fluoromethyl-2,2,3,3,3-pentafluoropropyl ether.

On page 492, right hand column, lines 19-25, Weinmayr discloses that "small quantities of 2,2,3,3 [where 2,2,3,3,3 must be a clerical error]-tetrafluorooxetane  $\text{CF}_2\text{CF}_2\text{CH}_2\text{O}$ , b.p.  $28^\circ\text{C}$  – are also formed."

Furthermore, on page 492, right hand column, lines 7-55, Weinmayr discloses that "Upon careful fractionation 300 g of 2,2,3,3-tetrafluorooxetane, b.p.  $28^\circ\text{C}$ , and....were obtained;" however, due to the indefinite disclosure such as "Nine condensations made as described above were combined..." it is not possible to calculate the percentage yield of the 2,2,3,3- tetrafluorooxetane obtained by Weinmayr.

The Examiner cites Weinmayr at "1-32 1<sup>st</sup> column on page 493."

Applicants note that on page 493, left hand column, lines 1-32 that there is no disclosure of 2,2,3,3- tetrafluorooxetane.

On page 493, in the right hand column under "Reaction of Tetrafluoroethylene with Formaldehyde," Weinmayr discloses "6 moles of formaldehyde is made to react with 3 moles of

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tetrafluoroethylene [TFE] in the presence of 600 g of HF to synthesize 429 (2.5 moles) of 2,2,3,3,3-pentafluoro-1-propanol in yield of 8.7% in terms of TFE, wherein 61 g (0.34 moles) of fluoromethyl-2,2,3,3,3-pentafluoropropyl ether is obtained as a by-product in yield of 11.3% in terms of TFE; total yield being 96.0%.”

This means that the reaction is mainly directed to formation of 2,2,3,3,3-pentafluoro-1-propanol, where 2,2,3,3-tetrafluorooxetane, when formed as a by-product, has a yield of 4.0% at the most.

In applicants' specification there is presented a Comparative Example that shows a process as disclosed by in JOC by Weinmayr where the yield of 2,2,3,3-tetrafluorooxethane was 18.8%. (See page 6 of applicants' specification)

In contrast, according to the present invention which is based upon the reaction in the presence of polyfluoroalkyl carboxylic acid or a polyfluoroalkyl ester, the yield of 2,2,3,3-tetrafluorooxethane is 35.3 to 39.3%, which is almost double as shown in the results of applicants' Examples 1-4.

It is submitted that applicants' claimed process for producing 2,2,3,3-tetrafluorooxethane (as a product as opposed to a minor by-product in the case of Weinmayr) is not at all taught or suggested by Weinmayr.

Applicants' process produces yields of 2,2,3,3-tetrafluorooxethane that are significantly greater than Weinmayr.

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Accordingly, it would **not** have been obvious....”to prepare 2,2,3,3-tetrafluorooxethane, by formaldehyde or its derivative and anhydrous hydrogen fluoride” as the Examiner concludes. Rather, it is submitted that applicants’ results are unexpected over the teachings of Weinmayr.

If anything, it would go against the teachings of Weinmayr to make or propose any modification that would increase the yield of by-products to the detriment of producing a greater desired product yield.

It is submitted that such an improper modification is tantamount to destroying the teachings of Weinmayr.

As held by the Board of Patent Appeals in *Ex parte Hartmann*:

References cannot properly be combined if effect would destroy invention on which one of reference patents is based. (*Ex parte Hartmann*, 186 USPQ 366 (PTO Bd App 1974))

Any modification to Weinmayr which would reduce the desired product yield would clearly go against the teachings of Weinmayr. Accordingly, it would not be obvious to proceed as the Examiner suggests.

Based upon the above distinctions between the prior art relied upon by the Examiner and the present invention, and the overall teachings of prior art, properly considered as a whole, it is respectfully submitted that the Examiner cannot rely upon the prior art as required under 35 U.S.C. §103 to establish a *prima facie* case of obviousness of applicants’ claimed invention.

It is, therefore, submitted that any reliance upon prior art would be improper inasmuch as the prior art does not remotely anticipate, teach, suggest or render obvious the present invention.

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It is submitted that the claims, as now amended, and the discussion contained herein clearly show that the claimed invention is novel and neither anticipated nor obvious over the teachings of the prior art and the outstanding rejection of the claims should hence be withdrawn.

Therefore, reconsideration and withdrawal of the outstanding rejection of the claims and an early allowance of the claims is believed to be in order.

It is believed that the above represents a complete response to the Official Action and reconsideration is requested.

If upon consideration of the above, the Examiner should feel that there remains outstanding issues in the present application that could be resolved, the Examiner is invited to contact applicants' patent counsel at the telephone number given below to discuss such issues.

To the extent necessary, a petition for an extension of time under 37 CFR §1.136 is hereby made. Please charge the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 12-2136 and please credit any excess fees to such deposit account.

Respectfully submitted,



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